

## WASTE ACCEPTANCE AND LOGISTICS

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### ABSTRACT

There are three major components which are normally highlighted when the Civilian Radioactive Waste Management Program is discussed -- the repository, the monitored retrievable storage facility, and the transportation system. These are clearly the major physical system elements and they receive the greatest external attention. However, there will not be a successful, operative waste management system without fully operational waste acceptance plans and logistics arrangements.

This paper will discuss the importance of developing, on a parallel basis to the normally considered waste management system elements, the waste acceptance and logistics arrangements to enable the timely transfer of spent nuclear fuel from more than one hundred and twenty waste generators to the Federal government. The paper will also describe the specific activities the Program has underway to make the necessary arrangements.

### INTRODUCTION

The Nuclear Waste Policy Act of 1982 (1), referred to as the NWPA, defined the division of responsibilities between the owners and generators of the spent nuclear fuel (SNF) and the Federal government with regard to the management of the SNF. The NWPA assigned the responsibility for interim storage of the SNF to its owners and generators.

The NWPA as amended authorized the Department of Energy (DOE) to construct a geologic repository and a monitored retrievable storage (MRS) facility. Both facilities must be licensed by the Nuclear Regulatory Commission (NRC), and the MRS is constrained with regard to its deployment schedule and capacity. However, the Department remains committed to the timely initiation of waste systems operations and confirmed this policy commitment in the Secretary of Energy's November 1989 report to the Congress, "Reassessment of the Civilian Radioactive Waste Management Program" (2).

While the NWPA is quite definitive with regard to many aspects of the development and implementation of the Federal high-level waste management system, the guidance regarding the actual arrangements for transfer of spent fuel from the owners and generators to the Federal system were rather sparse.

The NWPA authorized DOE to enter into contracts with the SNF owners and generators for the acceptance of title, subsequent transportation and disposal. The DOE is also to establish in writing criteria setting forth the terms and conditions under which such disposal services shall be made available. The law goes on to state that such contracts entered into by not later than June 30, 1983. As a result, in 1983 the Standard Contract for Disposal of Spent Nuclear Fuel and/or High Level Waste (3) was promulgated and 80 contracts for disposal services were executed with 66 different entities. These contracts further specify waste acceptance criteria and procedures.

To provide some additional background on the breadth of this interface. There are currently more than 120 commercial facilities producing and/or storing spent nuclear fuel (SNF) in this country that will need to have this SNF disposed of by the Federal government; this SNF is located at more than 70 sites. Almost all of these facilities are operating commercial power reactors. To date there have been some 58 different

fuel designs used in commercial nuclear power reactors. Some of the utilities have deployed dry storage technology at certain sites. Each of the reactors and sites have unique characteristics, and each of the operating reactors have their own priorities with regard to the utilization of onsite facilities and personnel. To add an additional institutional dimension to this interface, the utilities that operate the reactors and own the fuel are, of course, regulated so any decisions that have financial implications will be made under the oversight of the utility commissions.

With the above as background, "Waste acceptance and logistics" is the development of a system of procedures and protocols to ensure that the transfer of the SNF from the owners to DOE can be accomplished in an equitable, efficient and predictable manner.

### Waste Acceptance Organization

While the above information is certainly quite familiar to those who have been involved in the contract related processes or the ACR issues resolution activities, there have other changes made to ensure that the waste acceptance process will be accomplished in an efficient manner.

When Dr. John Bartlett accepted the appointment as Director of the DOE Office of Civilian Radioactive Waste Management (OCRWM) in 1989, one of his first acts was to organize OCRWM to align with the Secretary of Energy's November 1989 report to Congress on restructuring the civilian radioactive waste program. While the most visible elements of this new organization was the direct reporting of the Yucca Mountain Site Characterization Office to the OCRWM Director and the establishment of the Office of Systems and Compliance, another key feature of the organization was a clear recognition of the four broad functional requirements of the program in the program implementation elements of the organization. These functional requirements are identified as:

- (1) Waste Acceptance
- (2) Transportation
- (3) Storage
- (4) Disposal

An obvious part of this was the establishment of the Office of Storage and Transportation with responsibility for the development of the monitored retrievable storage facility and

the transportation system. This move would ensure greater emphasis on and coordination between those physical waste system elements that need to be available for the Department to begin accepting spent fuel. A more subtle but none the less deliberate move was assembling those elements of the organization that interacted with the nuclear utilities into the Logistics and Utility Interface Branch. This provides a single point of contact with the spent fuel generators, and the Branch is responsible for the development of the logistics arrangements with the spent fuel and high-level waste generators. The Logistics and Utility Interface Branch is combined with the Transportation Branch in a single Division within the Office of Storage and Transportation. This will ensure that the requirements and arrangements at the generators sites are fully factored into the development of the physical system to transport the spent fuel. Figure 1 illustrates this organizational relationship.

### Waste Acceptance Process

The waste acceptance process begins with the waste owners providing information to the DOE Office of Civilian Radioactive Waste Management on the quantities and characteristics of the waste (SNF) they currently have in inventory and the projections of the SNF which will be generated based on their plans for future operations. This and other information collected regarding the on-site and near site transportation capabilities forms the basis for planning the design and operational requirements for the waste management system (WMS). The SNF quantities and characteristics define the transportation system and waste system facility design requirements. The reactor on-site and near site data contribute to the transport cask designs and define the fleet size and modal mix requirements.

The second step in the process is to allocate the projected WMS receiving capacity among the waste owners. Although OCRWM is required to accept all permanently discharged SNF/HLW from each waste owner who enters into contract for disposal services, acceptance capacity will be limited in any

given year. Consequently, an acceptance priority ranking was established to allocate the projected WMS capacity. This ranking is based on the date of permanent discharge, as supplied by the waste owners, with the owners of the oldest fuel receiving the highest priority --i.e., oldest fuel first (OFF). It must be pointed out that the priority or rights established by this ranking method, accrue to the owner of the SNF -- not to the SNF itself. This allows the owner to deliver an equivalent quantity of any SNF desired, provided that it meets certain general spent fuel specifications included in Appendix E of the Standard Contract. These specifications address assembly physical dimensions, nonfuel components that are contained within the fuel assembly, and the cooling period for the fuel.

The priority is communicated through the annual publication of the Acceptance Priority Ranking (APR). The allocations are derived by applying a planned waste management system acceptance rate to the APR. The allocation is communicated through the Annual Capacity Report (ACR). An example of the information contained in the APR is shown in Fig. 2. An example of the ACR capacity allocation, which uses this information, is shown in Fig. 3.

The next step in the waste acceptance process is the Delivery Commitment Schedule (DCS). The Contract requires that the waste owners submit DCSs to DOE for approval at least 63 months prior to the date they wish to deliver their SNF/HLW. Once approved by DOE, the DCS becomes the planning basis for the waste owners to deliver and DOE to accept the SNF at the designated delivery site during the specified year corresponding to their allocation. Waste owners may start submitting DCSs as early as January 1, 1992. Each waste owner with an annual allocation (in the ACR) may submit one or more DCSs for each delivery year. The information contained in each DCS will identify where the SNF will be at the time of delivery, the preferred shipping mode, and the range of discharge dates of the SNF to be delivered. This information will be used by DOE to determine specific transport cask fleet and interim storage requirements. Waste owners possessing approved DCSs may exchange their DCSs with

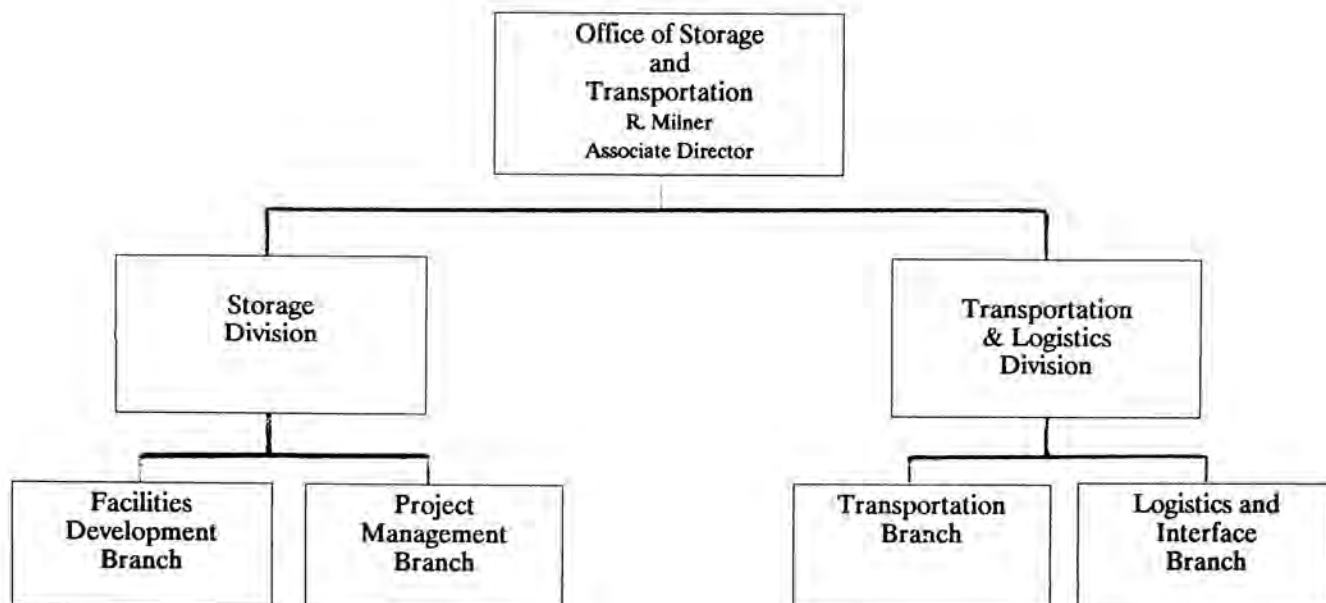


Fig. 1. Office of storage and transportation.

**1991 ACCEPTANCE PRIORITY RANKING  
LISTING OF SPENT NUCLEAR FUEL BY DATE OF PERMANENT DISCHARGE (1,2)**

Purchaser	Fuel Originator	Storage Location	Type <sup>3</sup>	Discharge Date <sup>4</sup>	# of ASMB	MTU	Cumulative Total MTU
General Atomics	General Atomics	General Atomics	RCH	67 11 30	1	<0.001	<0.01
General Atomics	General Atomics	General Atomcis	RCH	67 12 31	7	0.001	<0.01
*U.S. DOE	Big Rock 1	West Valley	BWR	68 06 21	5	0.638	0.64
General Atomics	General Atomics	General Atomics	RCH	68 10 31	1	<0.001	0.64
*U.S. DOE	Big Rock 1	West Valley	BWR	69 04 18	1	0.113	0.75
*Commonwealth Edison Co.	Dresden 1	Dresden 2	BWR	69 09 06	39	3.969	4.72
*Commonwealth Edison Co.	Dresden 1	Dresden 3	BWR	69 09 06	55	5.632	10.35
*Connecticut Yankee Atomic Power	Haddam Neck	Morris	PWR	70 04 17	51	21.441	31.79
Morris Operation	Dresden 2	Morris	BWR	70 06 05	29	5.569	37.36
*Southern Calif Edison Co.*	San Onofre 1	Morris	PWR	70 10 02	48	17.575	54.94
*U.S. DOE	GINNA	West Valley	PWR	71 02 04	12	4.586	59.52
Morris Operation	Dresden 2	Morris	BWR	71 02 26	215	41.528	101.05
*Connecticut Yankee Atomic Power	Haddam Neck	Haddam Neck	PWR	71 04 16	23	9.687	110.74
*Connecticut Yankee Atomic Power	Haddam Neck	Morris	PWR	71 04 16	29	12.213	122.95
General Atomics	General Atomics	General Atomics	RCH	71 05 31	8	0.001	122.95

Fig. 2. Annual priority ranking (sample).

Purchaser/Fuel Originator	Assemblies		MTU	
	Purchaser	Originator	Purchaser	Originator
Commonwealth Edison Company Dresden 1	206	206	21.10	21.10
Connecticut Yankee Atomic Power Haddam Neck	156	156	65.46	65.46
Consolidated Edison Company Indian Point 1	15	15	2.92	2.92
Dairyland Power Coop Lacrosse	6	6	0.72	0.72

Fig. 3. Annual capacity report (sample).

other holders of approved DCSs. The only constraint imposed on an exchange is that it is subject to DOE approval. The approval criteria are to ensure that an exchange would not have an adverse impacts on the WMS operations or other waste owners.

At least twelve months prior to delivery, those waste owners possessing approved DCSs, shall submit final delivery schedules (FDS) for approval. The FDS will provide additional specificity regarding the proposed delivery. The acceptable dates for delivery will be requested on the FDS. Sixty days prior to delivery, the waste owners specify the exact SNF they wish to deliver.

It is DOE's responsibility to provide the transport cask, ancillary equipment, training, and procedures for delivery, to the waste owners. It is the waste owners responsibility to load the cask. Any incidental maintenance required while the cask is on the waste owners site will be provided by the waste owner.

Cask maintenance requirements that cannot be performed on site, will be done by DOE at its cask maintenance facility.

#### Process Status

DOE has been collecting SNF inventory and generation information since the early 1980's. DOE issued a draft of its first APR in May of 1991. The document was issued in draft to allow the owners to verify the discharge dates and status of their discharged fuel. After incorporating the comments from the owners, DOE issued the first annual APR in December 1991 (3). The APR included fuel discharges through December 31, 1990. The initial ACR (4) was issued in June of 1987 and has been issued annually since then. The 1991 ACR (5) was also issued in December 1991 and is the first ACR based on the verified APR. The initial instructions for the preparation and submission of DCSs are to be provided to the contract holders early this year.

The above described documents are all identified in the Standard Contract and form the basis for the waste acceptance logistics planning. However, DOE and the owners recognized that the Contract contained insufficient detail to fully implement the waste acceptance process. In the 1987 ACR, DOE indicated that many contract related issues will require resolution so that the WMS can achieve maximum efficiency while attempting to assure equity among the waste owners. The Edison Electric Institute (EEI) and the U.S. Council on Energy Awareness (USCEA) established a committee to represent the waste owners in staff-to-staff technical exchanges with DOE. The formation of this committee was the beginning of the ACR Issue Resolution Process.

DOE prepared a list of 34 contract related issues which required resolution prior to waste acceptance. Both the DOE and the waste owners committee began the process of developing their positions (resolving) on each issue. Since 1987 the waste owners committee has developed positions on 18 of the issues. The DOE is using these positions, as well as results of its own analysis, as input to the development of its own position on the related issues.

The advantage of the issue resolution process is to provide a forum to identify, discuss, and resolve issues in a straightforward and cooperative manner. It also provides (1) DOE with a better understanding of the waste owners problems and priorities; (2) the waste owners with a better understanding of the DOE concerns and requirements; and most importantly (3) an alternative to litigation for resolution of issues.

Examples of issues currently being addressed are:

- Acceptance Priority for Shutdown Reactors
- Priority for Emergencies
- Definition of Failed Fuel
- Canister Dimensions for Non-Fuel Hardware and Failed Fuel

DOE expects to communicate its position on these and other issues in early 1992.

#### REFERENCES

1. "Nuclear Waste Policy Act of 1982," Public Law 97-425 (January 7, 1983) and the "Nuclear Waste Policy Amendments Act of 1987," Title V, Subtitle A, Public Law 100-203 (December 22, 1987).
2. U.S. Department of Energy, Report to Congress on Reassessment of the Civilian Radioactive Waste Management Program, DOE/RW-0247, Washington, D.C. (November 1989).
3. U.S. Department of Energy, "Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste," Code of Federal Regulations, Title 10, Part 961 (1990).
4. U.S. Department of Energy, 1991 Acceptance Priority Ranking, DOE/RW-0328P, Washington, D.C. (December 1991).
5. U.S. Department of Energy, Annual Capacity Report, DOE/RW-0146, Washington, D.C. (June 1987).
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